Subject: **Computer Science/IT**

Childwall Sports and Science Academy has a mission statement of 'Learning without Limits'. This means that we seek to engage students in the best possible learning experiences in order to enable them to achieve their potential. Be ambitious activities are those that take your regular curriculum further. They take the subjects you study in the classroom beyond that which your teacher has taught you or what you've done for home learning. For example, you may go into more depth on something you picked up in the classroom or learn about a new topic altogether. These activities are normally in the form of extra reading, but they can take many other forms, like watching videos online, downloading podcasts, attending lectures, visiting museums or entering academic competitions.

Engaging in be ambitious activities will help you develop a love for your favourite subject or subjects. In this booklet, there are a range of activities, suggested by your teachers. They are by no means exhaustive lists but should get you started. We would encourage you to share ideas and opportunities you come across with your teachers so that, over time, the recommended activities in this booklet can grow.

In the future, employers or universities will be interested to hear about what Be ambitious activities you have engaged in; they will be interested in what you have learnt and impressed by your efforts.

We wish you well in your pursuit of be ambitious activities!

Subject: Computer Science/IT

Hello World! Computer Programming for Kids and Other Beginners by Warren and Carter Sande This is an awesomely comprehensive book about programming. It's especially notable because electronic systems engineer Warren Sande wrote it alongside his young son, Carter, proving that the language and theories found inside its pages will be understandable to your kiddo	**Make Your Own Web Page–for Kids! by Ted Pederson** This one isn't so much focused on the programming components of game-making, but rather the basics of developing and publishing web pages. Which *is* an important tool for your geek to possess when he or she creates that super-addictive, multi-award-winning computer game.	**Algorithms to Live By: The Computer Science of Human Decisions** A fascinating exploration of how computer algorithms can be applied to our everyday lives.
National Museum of Computing Visit The National Museum of Computing is home to the world's largest collection of working historic computers. The National Museum of Computing (tnmoc.org)	Centre of Computing History Plan a visit to the centre of Computing History is much more than a museum. Based in Cambridge, it hosts hands-on exhibitions, educational workshops and a wide range of activities and events. Most importantly, it makes the history of computing relevant and fun for all ages! Rene Court, Coldhams Road, Cambridge, CB1 3EW http://www.computinghistory.org.uk/	Creative Writing Write a short essay debating the following question- Will Robots replace humans in the future?
Create your own Website Use this codeacademy tutorial to develop your skills using HTML and CSS to build your own website. https://www.codeacademy.com/courses/web-beginner-en-HZA3b/0/1	Python Develop your own Python Programming skills by challenging youseulf to complete as many tasks on Snakify as you can. https://Snakify.org/	Raspberry Pi Why not get yourself a credit card sized computer? Take a look here for inspiration. There are so many projects to complete. https://www.raspberrypi.org
Life of a computer scientists Carry out some research on famous computer scientists such as Mark Zuckerberg, Bill Gates and Barbara Liskov.	Careers in Computer Science? Carry out some research to find out about some careers with tech and computer science. Video Game Designer? Data Scientist? Software developer?	Wanted to know more about Computer science? Computer science is a very large subject with lots of applications. Computer scientists design new software, solve computing problems and develop different ways to use technology. What is computer science? - BBC Bitesize
Computer Science Basics: Algorithms We use computers every day, but how often do we stop and think, "How do they do what they do?" This video series explains some of the core concepts behind computer science. Computer Science Basics: Algorithms - YouTube	Learn to Code Where to start – Looking for something to do at home? Try one of the many excellent options code.org. Engaging and creative! https://www.youtube.com/watch?v=zN9DmouPpIU	The Young Codemaster Interesting watch! He codes, he writes his own programmes and he's helping teachers to set up computers. And he's only 8. But what could it mean when your child is 'too smart'? The story of Seth Yee and his parents, On The Red Dot's Wonder Kid series. https://youtu.be/3FvSLA-Kvvs

	Reading task		Writing task
	Listening task		Watching task
	Research task		Trip or visit
	Creative task		Student-led task

Be Ambitious – Key Stage 4

Subject: Computer Science/IT
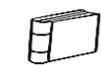
Artificial Intelligence – Write a short essay debating the following question - Will Artificial Intelligence Replace Mankind?	**Python** - Develop your Python programming skills by challenging yourself to complete as many tasks on Snakify as you can. https://snakify.org/	**Web Development** – Use W3Schools to practice using HTML to build websites. https://www.w3schools.com/html/
"Explained – Coding"– Watch this interesting documentary on Netflix all about coding.	**Computer Systems** – Visit a local 'Currys' and compare the specifications of computers. What information is provided? Choose your ideal computer and explain your choice.	**The Internet of Things** - Probably the most pervasive trend is the Web of Things, where just about everything we interact with becomes a computable entity. Research how future developments in this area may change.
BBC Bitesize – Read through some interesting Computer Science topics: https://www.bbc.co.uk/bitesize/examspecs/zmtchbk	**"Panorama - Are You Scared Yet, Human?"**– Watch this fascinating documentary on BBC iPlayer about developments in artificial intelligence.	**Learn SQL** - Use this W3Schools tutorial to learn how to use SQL to store, query, and manipulate data: https://www.w3schools.com/sql/
Modern Technologies – Write a discussion on how modern technologies have changed how organisations work.	**Cloud Computing** – Listen to programmer Jackson Gabbard explain how Facebook makes use of cloud-based storage.	**Networks** – Design a new school network. What network topology is it? What hardware will be required and why? What devices can connect to the network?
Boolean Logic – Create logic circuits using the AND, OR and NOT logic gates using https://logic.ly/	**Programming** – Learn a new programming language. Use W3Schools for tutorials.	**Computer Systems –** Research the different components that make up a computer system and find out the purpose of each.

	Reading task		Writing task
	Listening task		Watching task
	Research task		Trip or visit
	Creative task		Student-led task

Be Ambitious – Key Stage 5

Subject: IT

Excel Tutorial – Complete the Excel tutorial on W3Schools to practice using formulas and functions. https://www.w3schools.com/excel/index.php	**Cloud Storage** – Discuss the advantages and disadvantages of using cloud storage.	**User Interfaces** – Research different user interfaces and compare them. Explain the design features of each.
No Touch Interfaces - Forbes ranks no touch interfaces within the top five trends that will drive the future of technology. What can you find out about no touch interfaces? How may they benefit future technological developments?	**Modelling** – Create a spreadsheet model for a real world problem such as managing stock in a shop, organising an event or keeping track of income and outgoings.	**Cloud Computing** – Discuss the difference between cloud storage and cloud computing. Explain the advantages and disadvantages of using cloud computing.
Modern Technologies – Visit a local business and find out about how they use modern technology.	**Design a User Interface** – Design a user interface for a new app of your choice. Explain you design choices.	**Product Development** – Research how certain products have been developed. Which methodology was followed and why? What were the constraints during development?

	Reading task		Writing task
	Listening task		Watching task
	Research task		Trip or visit
	Creative task		Student-led task